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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/647,475

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Lim Su Lee

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EXAMINER

MARKOFF, ALEXANDER

ART UNIT

PAPER NUMBER

1711

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/647,475	Applicant(s) LEE, LIM SU	
	Examiner ALEXANDER MARKOFF	Art Unit 1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 13, 16, 18, 34, 35 and 45 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 13, 16, 18, 34, 35 and 45 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 16:

The claim is further indefinite because it is not clear what is referenced by “rotating ... along the same direction”. What rotation is required by the recitation of “rotating along direction”? Rotation of what is required?

If the rotation of the upper and lower brushes is referenced as the “rotation”, than this claim fails to further limit the subject mater of the parent claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 13, 16, 18, 34, 35 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moinpour et al (US Patent No 5,901,399) in view of Fishkin et al (US Patent No 6,202,658), Hashimoto et al (US Patent No 6,261,378) and the state of the prior art admitted by the applicants in the specification.

Moinpour et al and Fishkin et al both teach cleaning substrates with brushes and sprays. Both documents are concern about cleaning side surfaces of the substrates during cleaning of the main surfaces. Both documents teach brushing of the main surfaces and spraying the side surfaces. Moinpour et al teach the use of cylindrical brushes and a liquid jet to clean the side surfaces. See at least Figures 2c, 3, 6 and 7 and the related description. The document does not specify whether or not the liquid jet is energized. Fishkin et al teach the use of ultrasonic liquid jet to clean the side surfaces. Having the combined teachings of the cited documents it would have been obvious to an ordinary artisan at the time the invention was made to incorporate ultrasonic spray cleaning of Fishkin et al in the method of Moinpour et al instead or in

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addition to the spray of Moinpour et al to further enhance disclosed cleaning because the documents teach the action of brushes and ultrasonic to solve the same problem. An ordinary artisan would have been reasonably expected that the use of combined action would improve the side cleaning results. It would have also been obvious to include the referenced spray cleaning before, at the same point or after the brushing with reasonable expectation of adequate results in view of absence of unexpected results achieved by the claimed sequence of the steps. It is noted that Moinpour et al teach the use of their spray at or near the point of contact of the brush and the side surface (at least column 4, lines 42-45).

Further, it has been held that selecting or changing or reversing the sequence of steps is *prima facie* obvious in the absence of new or unexpected results *Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959). See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) and *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930).

The applicants have not demonstrated any unexpected results achieved by the sequence recited by the claims.

It would have been obvious to an ordinary artisan at the time the invention was made to apply the cleaning steps recited by the applied documents in any sequence.

Moinpour et al and Fishkin et al do not specifically recite application of their methods to LCD substrates. Both of the documents are mainly directed to cleaning

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semiconductor wafers. Fishkin et al, however, teach that the method can be applied to glass substrates.

Hashimoto et al teach that the same method of cleaning are conventionally applied to semiconductor wafers and glass substrates, such LCD glass substrates.

The LCD substrates conventionally have a rectangular shape. This is evidenced at least by the state of the prior art admitted by the applicants in the specification.

Having combined teachings of Moinpour et al, Fishkin et al and Hashimoto et al it would have been obvious to an ordinary artisan at the time the invention was made to apply a modified method of Moinpour et al to LCD glass substrates with reasonable expectation of success in order to have the substrates cleaned.

As to the limitation requiring moving of the substrate and the side brushes being parallel to the referenced direction: it is noted that Moinpour et al show that in a scrubber the substrate is not only rotated, but also is moving through the scrubber in a linear direction. See at least Figure 3 the related description. It would have been obvious to an ordinary artisan at the time the invention was made that the brushes shown on Figures 2c, 6, and 7 should be parallel to the direction of the movement at least at some time to enable the movement.

As to the limitation requiring cleaning of two side surfaces: It would have been obvious to an ordinary artisan at the time the invention was made that all surfaces of the LCD substrate should be cleaned. It would have been obvious to an ordinary artisan at the time the invention was made to provide and use an additional brush and an additional spraying device of Fishkin et al in the modified method of Moinpour et al in

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order to clean opposing surfaces of the LCD substrate in a single move in order to enhance cleaning. It is noted that, it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

6. Claims 13, 16, 18, 34, 35 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over the state of the prior art admitted by the applicants in the specification in view of Moinpour et al (US Patent No 5,901,399), Fishkin et al (US Patent No 6,202,658), and Hashimoto et al (US Patent No 6,261,378).

The applicants admitted in the specification (at least Figure 1 and the description at page 2, line 9 – page 4, line 6 that the conventional cleaning of LCD substrates comprises moving the substrate between an upper and a lower brush, which are rotated to clean the substrate.

On the other hand, Moinpour et al and Fishkin et al both teach cleaning substrates with brushes and sprays. Both these documents are concern about cleaning side surfaces of the substrates during cleaning of the main surfaces. Both these documents teach brushing of the main surfaces and spraying the side surfaces. Moinpour et al teach the use of cylindrical brushes and a liquid jet to clean the side surfaces. See at least Figures 2c, 3, 6 and 7 and the related description. Fishkin et al teach the use of ultrasonic liquid jet to clean the side surfaces.

Moinpour et al and Fishkin et al do not specifically recite application of their methods to LCD substrates. These documents are mainly directed to cleaning

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semiconductor wafers. Fishkin et al, however, teach that the method can be applied to glass substrates.

However, Hashimoto et al teach that the same method of cleaning are conventionally applied to semiconductor wafers and glass substrates, such LCD glass substrates.

Having the combined teachings of the admitted prior art and the cited documents it would have been obvious to an ordinary artisan at the time the invention was made to incorporate cleaning of the side surfaces into a conventional cleaning of LCD substrates disclosed by the admitted prior art. It would have been obvious to an ordinary artisan at the time the invention was made to incorporate ultrasonic spray cleaning of Fishkin et al and brush cleaning of Moinpour et al to clean the side surfaces the cited documents teach the action of brushes and ultrasonic for cleaning side surfaces. An ordinary artisan would have been reasonably expected that the use of combined action would improve the side cleaning results.

It would have also been obvious to include the referenced spray cleaning and brush cleaning of side surfaces before at the same point or after the brushing with reasonable expectation of adequate results in view of absence of unexpected results achieved by the claimed sequence of the steps. It is noted that Moinpour et al teach the use of their spray at or near the point of contact of the brush and the side surface (at least column 4, lines 42-45) after brush cleaning of the main surfaces (with respect to the movement of the substrate).

Further, it has been held that selecting or changing or reversing the sequence of steps is *prima facie* obvious in the absence of new or unexpected results *Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959). See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) and *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930).

The applicants have not demonstrated any unexpected results achieved by the sequence recited by the claims.

It would have been obvious to an ordinary artisan at the time the invention was made to apply the cleaning steps recited by the applied documents in any sequence.

Response to Arguments

7. Applicant's arguments filed 6/24/11 have been fully considered but they are not persuasive.

The applicants amended the claims.

The amendment has obviated most of the rejections made under 35 USC 112 in the previous Office action.

However, one of the rejections of claim 16 has not been addressed by the amendment. This rejection is maintained.

The applicants argue that the previously applied rejections are not proper with the amended claims.

The applicants allege that the applied art does not teach the sequence of the cleaning steps recited by the claims and that the claims should be allowed.

This is not persuasive.

The applicants have not demonstrated any unexpected results provided by the claimed sequence.

It has been held that selecting or changing or reversing the sequence of steps is *prima facie* obvious in the absence of new or unexpected results *Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959). See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) and *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930).

Thereby, it would have been obvious to an ordinary artisan at the time the invention was made to apply the cleaning steps recited by the applied documents in any sequence.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER MARKOFF whose telephone number is (571)272-1304. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Art Unit 1711

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